

TEACHING POLITICAL ECOLOGY

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Pulp Mills, Fish Contamination, and Fish Eaters: A Participatory Workshop on the Politics of Expert Knowledge

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As more countries, industries, and international agencies respond to environmental concerns, their representatives look to nations like Canada for expertise in environmental assessment, policy, and standards, and for techniques to assist them in identifying and predicting the impacts of proposed projects on the biogeophysical environment and on human health and well-being. Often the expertise of environmental specialists and the environmental impact assessment (EIA) process in developed countries is seen as objective, and applicable to all parts of the world.¹ To challenge these assumptions, members of a Canadian environmental group, Friends of the Athabasca Environmental Association (FOTA), designed a series of participatory workshops based on their experiences in a major environmental controversy in Canada.² Participation in these workshops should help individuals and community groups to think critically about values embedded in environmental assessment and to make connections between the techniques of expert knowledge and their own lives. This FOTA workshop examines aspects of political ecology -- ethnocentrism in health standards -- that bring into question the applicability of prevailing EIA practices across cultures and societies.

The Fish Workshop

Time it takes: 60 minutes

Tools: 35 grams of fish in a clear container or plastic bag a small piece of paper per person

some pencils

Key concepts:

food chain

bioaccumulation

biomagnification

dioxin and furan

persistence

special populations at risk

fish livers

ethnocentrism

health standards

Politics and ecology intersect in many ways in modern society; one key place is in health standards. We all eat foods containing small amounts of pollutants. Health standards set threshold amounts for these foods beyond which they are unsafe to eat. But we all do not have the same diets. Nor, do we all enjoy the same level of health. Whose eating patterns are health standards based upon, and which groups in society do standards fail to protect?

In showing how politics and bias can occur in the application of scientific health standards, the fish workshop examines one aspect of pulp and paper pollution, that is toxins such as dioxin and furan and other organochlorines released in pulp-mill effluent and their effects on fish and fish eaters. The exercise could easily be adapted to discuss other industrial pollutants, and other foods for which health standards have been set. This fun exercise is often quite revealing, especially when conducted with a group of people from different countries or regions of a country, or from diverse ethnic backgrounds.

How it is done

Pass around the 35-gram portion of fish and ask participants to guess its weight. Next, tell them that it weighs 35 grams, or slightly more than one ounce. Now that they understand the weight of this portion of fish, ask each person to estimate their own daily consumption of fish and to write the weight on their piece of paper (1 ounce equals 28.5 grams). If participants eat very little fish they may find it hard to estimate their daily consumption. In these cases the participants should calculate the weight of fish they eat in one month, then divide that number by 30 days to arrive at an estimate of their daily consumption. As well, those participants who eat fish liver should put an asterisk on their paper next to their daily fish consumption estimate.

Ask participants to compare their daily fish consumption weights and line up in order ranging from the lowest to the highest amount of fish consumed.

At a recent workshop conducted with twenty participants, a fish survey revealed consumption ranging from a few grams (zero for vegetarians) to 750 grams or more of fish per day. Participants from Asia and native people from northern Canada had the highest daily levels of fish consumption. Some reported eating as much as 450, 500, or 700 grams of fish per day. As well, one non-native fisherman from

Newfoundland reported eating about 750 grams of fish per day (1 pound equals 454 grams).

Facilitators should now inform the group that dioxin and furan are created by the use of chlorine in the bleaching process of pulp mills and these contaminants are released with treated waste waters into the environment. The pulp-mill pollutants are taken up by organisms from their ambient environment -- a process called bioaccumulation.³ The organochlorines dioxin and furan are extremely persistent and pass through the food web to higher consumers including humans.⁴ These trace contaminants increase in concentration -- a process called biomagnification -- as they pass up the food chain. At the public review of the EIA of the Alberta-Pacific pulp mill, one scientist explained that "dioxins and furans at very low, even undetectable concentrations in water had been concentrated in organisms enough to cause reproductive failure in predatory fishes such as rainbow trout, and in fish-eating birds such as heron, gulls, terns and cormorants due to biomagnification in food chains."⁵ In our case the food chain would be organisms and algae -- > fish -- > birds -- > humans that eat fish and birds, and our concern would be the effects on humans of eating large amounts of fish.

Look at your line-up of participants and separate those people who consume less than 35 grams of fish per day from the rest of the group. The facilitator should explain that Health and Welfare Canada set permissible concentrations of dioxin and furan in fish for human consumption at rates that would allow a person weighing about 70 kilograms to eat an average of 35 grams, or slightly more than one ounce, of fish per day. According to Health and Welfare Canada, the people in the line-up consuming 35 grams or less of fish daily are protected by the current health standard. Therefore, those eating more than 35 grams per day are considered at risk.

Discussing the activity

To involve participants in the learning process, the facilitator should have the group identify the characteristics of those individuals

Fish workshop line-up shows participants from Canada, Switzerland, Brazil, the Philippines, and Bangladesh who consume less than 35 grams of fish a day, and high risk participants from aboriginal communities in Canada and one Filipino who consume between 35 and 700 grams of fish daily, as well as some who eat fish livers.

eating more than 35 grams of fish per day. What do they have in common -- besides a love of fish? What is unique about the high risk group and what sets them apart from the low risk group? Are there further sub-groups identifiable within the high risk group based on region of origin, race or ethnicity, occupation, and so on?

Asking participants to stay in the line-up and to help explain why some groups of people might find themselves unprotected by health standards, the facilitator introduces the following four issues: recognizing values in standards; special populations at risk; the presuppositions of risk assessment questions; and ethnocentrism.

Recognizing values in expert knowledge: standards

Standards define the thresholds at which certain behaviours are acceptable.⁶ Health standards are designed to protect a group of animals or people. For example, a Canadian health standard for fish consumption was developed to protect people who eat fish from waters with high amounts of the types of pollution created by pulp mills. The standards set the threshold at 35 grams of fish per day, ten times the average consumption patterns of the average human being in Canada, who is considered to eat one fish meal a week, or somewhere between 1.5 and 3.5 grams a day.⁷

Yet some people eat large amounts of fish. We learned that many Asians and many aboriginal peoples from northern Canada not only eat fish daily but also consume all parts of the fish including the organs, which they consider a delicacy. One aboriginal fisherman described how he sold gutted fish to non-natives, and saved the livers of the fish (burbot) for himself and his grandmother who "drenched a couple of dozen fish livers in shake 'n' bake and ate 'em up for a special dinner."⁸ It is important to note that the liver detoxifies the blood, therefore people who eat the liver of fish from polluted waters are exposed to higher concentrations of toxins. As well, toxins concentrate in fat, therefore people who eat fatty parts of fish from polluted waters also are exposed to more pollutants.

At this point, the facilitator should ask all those participants who marked an asterisk next to their daily fish consumption weights to step forward. Facilitators should direct the fish liver eaters in the low fish consumption group to move to the high risk group, and any fish liver eaters in the high risk group to move to the top of the line.

Recognizing special populations at risk

As this workshop demonstrates, social backgrounds, dietary habits, and cultural practices such as which part of a fish is eaten or discarded make a difference in how standards protect various groups of people. In the EIA document of the Alberta-Pacific pulp mill, fish consumption by aboriginal peoples in the lower Athabasca, Slave, and Mackenzie river systems was assumed to resemble that of the average urban Canadian who eats about one fish meal per week, or less than 3.5 grams per day. The testimonials by aboriginal peoples to an independent panel reviewing the Alberta-Pacific EIA revealed that many natives eat large amounts of fish, and contrary to claims in Alberta-Pacific's EIA document, many natives also eat fish livers.

At this point, ask a participant to read the testimony of Frank Pope, who spoke at the Alberta-Pacific pulp mill hearings on behalf of the Shihta Regional Council and the Mackenzie Great Bear Development Impact Zone Society, representing the people living in the Sahtu region (the lower Mackenzie Valley) and along the shores of the Mackenzie River, Great Bear Lake, and Colville Lake:

Alberta-Pacific's EIA says that dioxins and other chlorinated organics accumulate in the fatty tissues of fish and in fish livers. The EIA goes on to say that human ingestion of chlorinated organics would be slight because people don't eat fish liver. In fact, loche or burbot liver is considered a delicacy. If dioxins

and other chlorinated organics are carried into our waters, can we expect that the quality of our fish resources will continue to deteriorate? Can we expect that our children will not be able to eat fish? Will traditional delicacies like loche liver be unknown to our children? In the future, will the lifestyle and the culture of the Dene and Metis that is so strongly influenced by the Mackenzie River and its resources be alive only in the pages of anthropological journals?⁹

The debate before the review panel, captured in the words of Mr. Pope, focused on natives in northern Alberta and the Northwest Territories who consume average amounts of fish,¹⁰ not those who eat extremely large amounts of fish, or large amounts of fish livers. In fact, diet differs not only between groups but also within groups of people. As well, health and well-being differ within a group of people, making some more susceptible to pollution impacts. Jack Vallentyne, testifying to the review panel on behalf of the Athabasca Tribal Council, made two qualifications: 1) in toxicological studies it "is not the mean [fish] consumption, but rather the upper extremes of consumption which are the focus of concerns"; and 2) that the very young, the very old, and the health impaired [as well as pregnant women] are seldom taken into account in risk calculations.¹¹ This means we must consider those people most at risk within a population at risk -- a special population at risk.

Working from the wrong end

A different approach to risk assessment and pollution impacts on human health is argued by Mary O'Brien who suggests that "to ask risk-assessment questions...is to contribute to the currently dominant, but suicidal, assimilative capacity approach and practices of our society." The assimilative capacity approach asks questions such as "How much can we expose people to certain compounds without killing them, making them sick, reducing their intelligence or reproduction, or damaging their immune system?" O'Brien prefers an alternative assessment approach, which asks "What is the least we can get away doing to Earth? How can we best institute precautionary behaviors?"¹² In a similar vein, Theo Colborn challenges the way we think about health and risk: "By using cancer and mortality as the end points to determine the safety of chemicals in use every day, we have put biodiversity, actually even human survival, at risk." Colborn wants to work from a different end point than that used even by Health and Welfare Canada: "if we wanted to protect the ecosystem, we should have been looking further, toward the level of functionality -- the ability of the individual to produce offspring to survive to adulthood, and then reproduce themselves. We're talking about an end point called survival of the species. I think this is how we're going to have to start looking at chemicals if we're going to be protective of ecosystems, biodiversity, and human survival."¹³

A note on ethnocentrism

On a couple of occasions, scientists in the fish workshop have argued that the scientific underpinnings of this standard -- that a person of normal body weight can safely consume 35 grams of polluted fish per day -- is based on good science. Or, they argue that although scientific knowledge-building such as data collection or research may be incomplete or uncertain, what constitutes scientific knowledge is not determined by our values, it is objective. In short, scientists tend to be uncritical of science and expert

knowledge itself. For them science is not ethnocentric or value laden, it is just misapplied sometimes.¹⁴ Brian Wynne, a sociologist of science, disputes such claims and argues that "the more subtle and difficult question is whether the deeper epistemological commitments on which scientific knowledge is built serves to constrain the vision of what is at stake, socially and culturally ...beneath the level of conflicting explicit preferences or interests lies a deeper sense in which scientific knowledge tacitly reflects and reproduces normative models of social relations, cultural and moral identities, as if these are natural."¹⁵

The example of ethnocentrism, implicit and unrecognized in the Alberta-Pacific EIA and the Canadian health standards for fish consumption, assumes that all people in society have the same consumption patterns as the average white, urban person. Some sociologists characterize such unrecognized bias as institutional or structural racism, that is, a routine practice that discriminates against or exercises power over less powerful groups in society. Further, the health standard serves the interests of industrial polluters who must reduce emissions only to a level that minimizes effects on human health as defined by the mean fish consumption of white middle class Canadians. What would be the implications to polluters if health standards for fish consumption were based upon the upper extremes of fish consumption of minority groups and were designed to protect special populations at risk rather than asking them to change their traditional diets?

The fish workshop exposes some ways in which the dominant culture influences how experts pose questions, identify facts, collect data, define research problems and set standards, and reveals some of the ethical and moral issues embedded in health standards and debates about risk assessment.

Thought questions

Break out into small groups. Discuss the following questions and report back to the larger group.

1. Identify eating practices from your own region that differ from the dominant western diet.
2. Identify special populations at risk in your community or society. Ask the question "Whose health are we not protecting?"
3. Consider what this simple exercise reveals about apparently objective scientific principles. Do standards tend to privilege the point of view, cultural norms and values of the dominant culture over those of another culture or group in society?
4. What would be the implications if we adopt Mary O'Brien's and Theo Colborn's alternatives to the assimilative capacity approach?

Conclusion

Political ecology should not simply be debated at the theoretical level of critical academics and elite

practitioners but brought to people in communities who find themselves in the process of environmental impact assessment or land use planning or ecosystem basin management planning. It is these people, on the front lines, who must prepare themselves to engage the "paladins" of expert knowledge in environmental assessment such as civil servants from the departments of environment -- natural and social scientists, and community development workers; consultants -- academics or former academics who sell expertise to the highest bidder; and experts from industry who may work for individual corporations or industry umbrella organizations such as PAPRICAN, a pulp and paper research group in Canada. These elite specialists operate not only in Canadian "epistemic communities," but also act as roving bands of experts who travel the world to counsel foreign governments on health standards and the impacts of mega projects, or to assist transnational corporations with their industrial expansions.¹⁶

FOTA uses participatory workshop methods to assist local groups to prepare for the encounter with experts, and the expert techniques of environmental assessment. Local conditions, eating habits, history, culture, and an understanding of social context and ecological conditions provide the knowledge and experience against which to test and contest the tools and techniques of experts, subjecting them to tough scrutiny, and searching out value judgements, professional ideologies, ethnocentric assumptions, scientific presuppositions, and even racist beliefs.¹⁷

Footnotes

1See "Goals and Principles of Environmental Impact Assessment," Decision 14/25 of the Governing Council of UNEP, of 17 June 1987; David P. Lawrence, "The Characteristics and Aims of Environmental Impact Assessment," Plan Canada, March, 1994; and Holly Welles, "EIA Capacity-Strengthening in Asia: The USAID/WRI Model," *The Environmental Professional*, 17, 1995. For a more critical perspective, see Seth Appiah-Opoku, "Theoretical Orientations of Environmental Assessment in Canada: Application to the Third World," *Environments*, 22, 3, 1994.

2This workshop was designed by FOTA with encouragement from Noel Keough of The University of Calgary's Canada-Asia Partnership. For examples of other participatory workshops and perspectives, see Jose Roberto Guevara, *Renewing RENEW: A Restoration Ecology Workshop Manual* (Quezon City, Philippines: Center for Environmental Concerns -- Philippines and INTERPARES -- Canada, 1995); Rick Arnold, Bev Burke, Carl James, D'Arcy Martin, and Barb Thomas, *Educating for a Change* (Toronto, Ontario: Between the Lines and Doris Marshall Institute for Education and Action, 1991); and Deborah Barndt, "Tracing the Trail of Tomasita the Tomato: Popular Education around Globalization," *Alternatives Journal*, 22, 1, January/February, 1996.

3D. J. H. Phillips, "Bioaccumulation," in Peter Calow, ed., *Handbook of Ecotoxicology* (London: Blackwell Scientific Publications, 1993), p. 378.

4A 1995 study confirms the persistence in the environment of toxins produced by pulp mills. "For example, osprey downstream from the Celgar mill [in British Columbia] do not show a declining trend even though the mill had non-detectable levels of TCDD and TCDF since mid-1993." The study

concludes that toxins persist in river suspended sediments and bottom sediments and that recovery from historical contamination may be slower than anticipated. (Jay C. Van Oostdam, "Decreased Dioxin and Furan Loadings from British Columbia Pulp Mills, Environmental Response, Future Directions?" 15th International Symposium on Chlorinated Dioxins and Related Compounds, Volume 24: Bioremediation, Sources, Atmospheric Processes, Environmental Levels, Environmental Fate of Organohalogenes [Edmonton: Dioxin'95 Secretariat, 1995], pp. 257-261.) The Alberta- Pacific EIA review panel also explained how these toxins are persistent within humans: "dioxins, furans, and many other organochlorines have long residence in the bodies of many animals including humans, and a high affinity for fats. As a result, some organochlorines can be passed from one human generation to the next [six generations into the future] with high efficiency, due to the high fat content of reproductive material and mammalian milk." Alberta-Pacific Environmental Impact Assessment Review Board, The Proposed Alberta-Pacific Pulp Mill: Report of the EIA Review Board, March 1990 (Edmonton, Alberta: Alberta Environment, 1990), p. 24.

5 Alberta-Pacific Environmental Impact Assessment Review Board, *op. cit.*, p. 23.

6 Ellen Baar, "Standard Setting," in Allan Greenbaum, Alex Wellington, and Ellen Baar, eds., *Social Conflict and Environmental Law*, Volume One (Toronto, Ontario: Captus Press, 1995).

7 Testimony by Dr. Wayland Swain in J. G. Moore and Associates Ltd., The Alberta-Pacific Environment Impact Assessment Review Board Public Proceedings, Volumes 1-55 (Edmonton, Alberta: J. G. Moore and Associates Ltd., 1989), p. 5885.

8 Authors' interview with Clayton Burke, Fort Smith, Northwest Territories. September 1992.

9 The Alberta-Pacific Environment Impact Assessment Review Board Public Proceedings, Volume 1-55, *op. cit.*, p. 5376.

10 For a U.S. perspective, see Patrick C. West, "Health Concerns for Fish- Eating Tribes? Government Assumptions Are Much Too Low," *EPA Journal*, 18, 1, March, April, 1992.

11 Mary Richardson, Joan Sherman and Michael Gismondi, *Winning Back the Words: Confronting Experts in an Environmental Public Hearing* (Toronto: Garamond Press, 1993), p. 98.

12 Mary H. O'Brien, "Being a Scientist Means Taking Sides," *BioScience*, 43, 10, November, 1993, p. 706.

13 Environmental Impact Assessment Review Team, "An Interview with Theo Colborn," *Environmental Impact Assessment Review*, 14, 1994, pp. 491-492.

14 For a discussion of the selective use of evidence, results, and presuppositions in scientific research, see Brian Martin, *The Bias of Science* (Canberra: Society for Social Responsibility in Science, A.C.T.,

1979) and Sharon Beder, "Bias and Credibility in Environmental Impact Assessment," *Chain Reaction*, 68, February, 1993, and *Toxic Fish and Sewer Surfing* (Sydney: Allen & Unwin, 1989).

15Brian Wynne, "Scientific Knowledge and the Global Environment," in Michael Redclift and Ted Benton, eds., *Social Theory and the Global Environment* (London: Routledge, 1994), pp. 172 and 176.

16For example, see Peter Haas, "Do Regimes Matter? Epistemic Communities and Mediterranean Pollution Control," *International Organization*, 43, 1989. For a critical discussion of experts see Steve Breyman, "Knowledge as Power: Ecology Movements and Global Environmental Problems," in Ronnie D. Lipschutz and Ken Conca, eds., *The State and Social Power in Global Environmental Politics* (New York: Columbia University Press, 1993); Michael Goldman, "'Customs in Common': The Epistemic World of the Commons Scholars," *Theory and Society* (forthcoming); and Tom Waller, "Knowledge, Power, and Environmental Policy: Expertise, the Lay Public, and Water Management in the Western United States," *The Environmental Professional*, 17, 1995.

17See Sandra Harding, ed., *The "Racial" Economy of Science: Toward a Democratic Future* (Bloomington: Indiana University Press, 1993).